THE ROUND TABLE
Monthly Newsletter Of The Denver Radio Club
Since 1917 August 2023

President's Message

By Gerry Villhauer, W0GV

Hello DRC Members.

It has been a fast and furious summer for Cathy and me. I am writing this on our way back from Oshkosh, Wisconsin where we attended the annual Experimental Aircraft Association's "Airventure". If you like aircraft, you should attend this annual event at least once. Traveling is fun but it is always good to be back home.

Our DRC Saturday events have been a great success. They started to get our members together and "Play Radio"; Not knowing how successful they would be. It is apparent that all who attended really enjoyed the activity and we have had suggestions to do more of the same. We will look at doing just that as time goes on. Our last scheduled DRC Saturday for this season is Saturday September 16, 2023.

Our August program will be presented by Amanda Alden, K1DDN our ARRL Rocky Mountain Section Manager for Colorado. Amanda will bring us up to date on happenings at the League and the direction the ARRL is progressing. The date is Wednesday August 16, 2023 at 7 p.m.

PLEASE don't forget to attend THE BIG ONE! Our DRC Hamfest on Aug 27, 2023 at the Adams County Fairgrounds. See the DRC website, w0tx.org for more information - Table Reservations and Admissions. This is our Big Event for the year and we need every members' support and *bring a friend*.

Thanks to all of our new members who have recently joined the DRC. Your support is very much appreciated. Please come to meetings and events and stay active. Your name and call will be posted in this edition of the Round Table.

73 for now,

Gerry
W0GV
President

Who's New In The DRC?

From Cathy Villhauer, N0CRZ, DRC Membership

The DRC is a very active club in the Denver metro area and we'd like to have all of our members listen for these new calls and welcome them to the club and repeaters. Welcome to our newest members:

None for August

We have a number of activities throughout the year and we'd like very much for you to participate in serving your community. If you have questions please feel free to ask on any of the repeaters or see the contact information on the last page of this publication.

Also, please join us once a month at the regular club meeting on the 3rd Wednesday at 7:00 p.m. For new hams we have the Elmer session which starts at 6:00 p.m. before the regular meeting.

King Soopers Rewards Program & Helping the DRC

Provided By Cathy Villhauer, N0CRZ

The DRC is now registered with the Kings Soopers Reward program. If you register your loyalty card with the DRC in their system, the club benefits. Here are their instructions:

For King Soopers Stores - go to kingsoopers.com
For City Market Stores - go to citymarket.com

Once logged into their King Soopers or City Market account they can search for The Denver Radio Club either by name or VK146 and then click Enroll. New users will need to create an account which requires some basic information, a valid email address and a loyalty card.

*Customers must have a registered King Soopers or City Market loyalty card account to link to your organization.

*King Soopers or City Market loyalty cards are available at the customer service desk.

Purchases will not count for your organization until after your participants register their loyalty card. Participants must swipe their registered card or use the phone number that is related to their registered card when shopping, for each purchase to count.

Seeking DRC Website & WordPress Admin Volunteer

By Mark Thomas, N0XRX

Are you familiar with web site management and more importantly WordPress? Do you want to be more involved with the club? Do you have some knowledge or drive to learn web hosting and management techniques?

If so, we have the opportunity for you!!

The Denver Radio Club's WordPress Administrator role doesn't take a lot of time as our content doesn't change much. We have some initiatives that will take a few more hours to complete but once finished the site only needs general maintenance. If you don't know WordPress but have been interested in learning, and are a fast learner, please let us know.

Job duties (generic):
- Responsible for implementation and management of the website
- Offering site recommendations or improvements
- Review and manage plugins
- Troubleshoot and correct issues
- Backup, creation, transfer and restoration of a WordPress site

We would like to have multiple people in this role to provide backup and support if possible.

If interested or know someone that is, please contact Mark Thomas, n0xrx@w0tx.org

Question of the Month

By Bill Rinker, W6OAV

How many 8 foot ground rods does it take to replace radials on an HF ground mounted vertical?

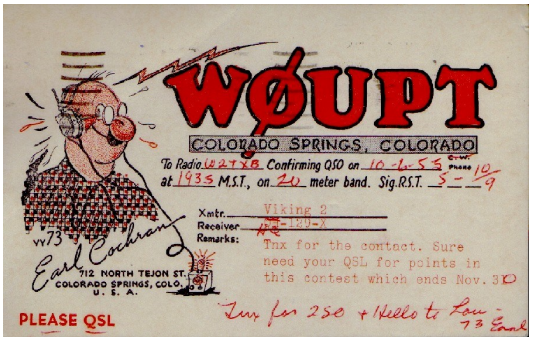
The answer can be found on page 4 of the Dec 2007 issue of the *Round Table*: https://w0tx.org/RoundtableArchive/2007-RoundTables/RT200712(DEC).pdf

Calling all QSLs…

By Brennan Pate, AD0UZ

If you would like to have your QSL card featured in an upcoming edition of the Roundtable please send a copy of it (i.e. PDF or JPG) to roundtable@w0tx.org.

Alternatively, if you have received a unusual or exotic one in the past and would like to share it, then send it on over.



A DMR / BrandMeister Primer

By Bill Rinker, W6OAV

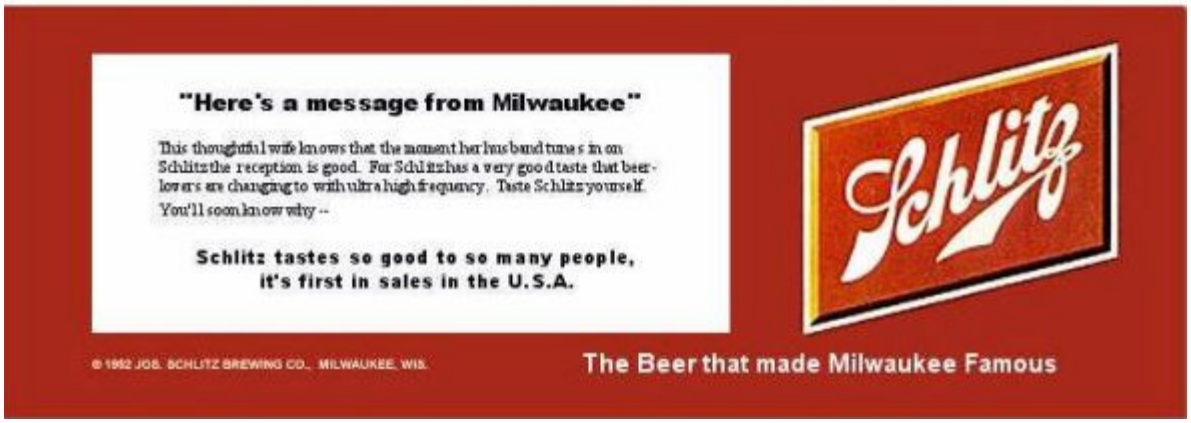
Our DMR/BrandMeister repeater is getting busier every day. DMR/BrandMeister is a very interesting digital protocol that allows one to “work the world” with just an HT. If you are not familiar with DMR/BrandMeister, visit the YouTube site at https://www.youtube.com/watch?v=eDmjwh0RGoo. KC5HWB has an in depth presentation which will provide all you need to know. His presentation will help you decide whether to get into the protocol and, if so, how to use it.

If you want to monitor the most popular DMR/BrandMeister talk groups (equivalent to voice channels) on your computer, go to one of the following links:
Worldwide: https://hose.brandmeister.network/group/91/
USA: https://hose.brandmeister.network/group/3100/
General Chat: https://hose.brandmeister.network/group/310/
W0TX Local Chat: https://hose.brandmeister.network/group/310804/

As of this publication there are a total of 1,643 official talk groups. There are also additional unofficial talk groups.

The Good Ole Days?

Submitted By Bill Rinker, W6OAV
From Rockwell Collins "Signals"



1/4λ HF Vertical antennas

By Bill Rinker, W6OAV

A common perception is that HF 1/4λ verticals radiate equally poor in all directions. This is not true if they are properly configured. This article will discuss a vertical's performance compared to horizontal dipoles and how to not only improve a vertical's performance but also how to give it gain. Years ago I did construct the antennas described in this article. They definitely do work as described!

The Standard 1/4λ Vertical

One of the primary advantages of HF vertical antennas is that they are omni-directional, meaning they transmit and receive in all directions. (This will be discussed later in this article). With a good set of radials (between 4 and 16), a 1/4λ vertical will produce a good low angle of radiation in all directions. This low angle reduces the number of lossy hops that HF radio signals must make to reach their destination which makes a vertical antenna a good choice for DX—especially on the lower ham bands. Vertical antennas are normally easy to mount, requiring a single mount at the base. They can be hung from tree branches and be virtually hidden when made of wire which is good in HOA situations. It is also common to build a vertical out of a mobile whip. Articles in [1] below discuss building efficient 1/4λ vertical antennas.

Figure 1a shows the typical RF radiation pattern of a 1/4λ vertical. Note that the RF current is maximum at the base of the vertical. Since the amount of RF radiation is proportional to the amount of RF current, this means that the bulk of the radiation is from the lower half of a ground mounted vertical. Thus the radiation must propagate through structures around the vertical possibly resulting in extra loss to the signal. This will be important in the discussions later in this article. Figure 1b shows the typical RF elevation (red) and azimuth (blue) radiation patterns of a 1/4λ vertical.

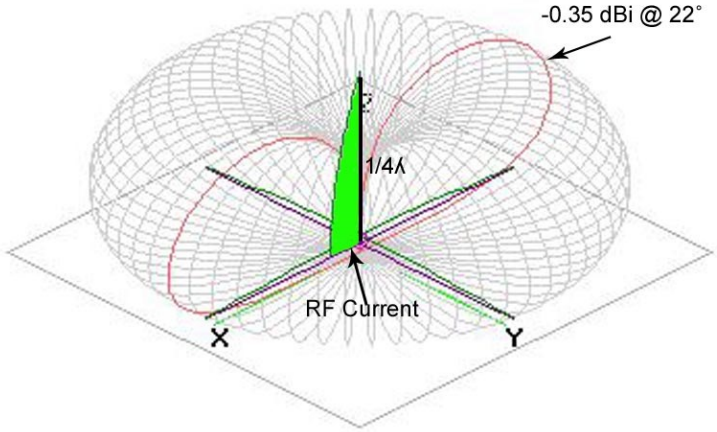


Figure 1a - The 1/4λ vertical

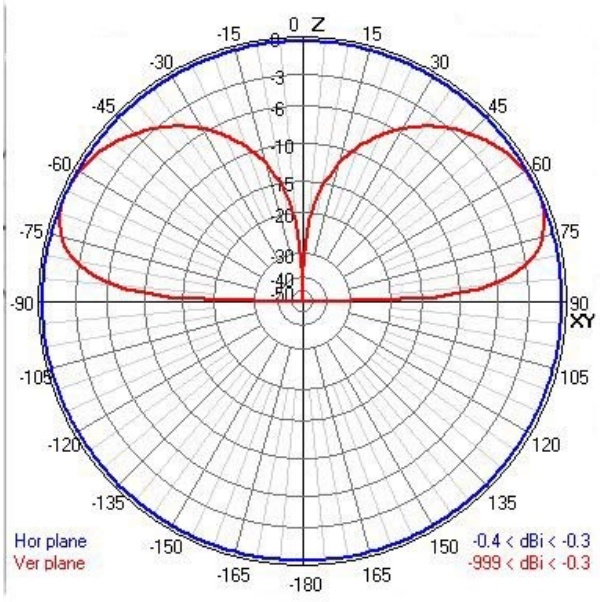


Figure 1b - Radiation patterns of a 1/4λ vertical

1/4ʎ Verticals vs Horizontal Dipoles

Table 1 summarizes the pros and cons of a ground mounted 1/4ʎ vertical verse a horizontal 1/2ʎ dipole.

Perimeter	Table 1 - 1/4ʎ Vertical vs Horizontal Dipole
Noise	About the same as a dipole at 20 meters and above. Noisier below 20 meters.
RF Pattern	Omni whereas dipoles have figure 8 patterns.
Installation	Easier to install and usually more economical as a dipole normally requires 3 supports.
Visibility	Stealthier compared to a dipole (Good for HOA situations).
DX Angle*	Favors DX angle. Dipole must be high for same radiation angle. (An issue at 40m and below).

*A horizontal dipole needs to be 1/2ʎ above ground to have better low-angle performance than a 1/4ʎ vertical. Getting a horizontal dipole that high could be an issue on 40 meters and below. See Figure 2a which compares the elevation radiation patterns of a 40 meter 1/4ʎ vertical with those of 40 meter dipoles at 1/4ʎ and 1/2ʎ heights. Note that the vertical's pattern in the DX angle is approximately 2 dB less than that of a dipole 1/4ʎ high and approximately 6 dB less (1 S Unit) than that of a dipole at 1/2ʎ high. However, a 1/4ʎ vertical does have gain over a horizontal dipole when looking at the radiation pattern off the ends of the dipoles. Figure 2b shows that the vertical's radiation pattern is stronger and at a lower angle then those off the ends of the dipoles.

These patterns are valid when extrapolated to any ham band.

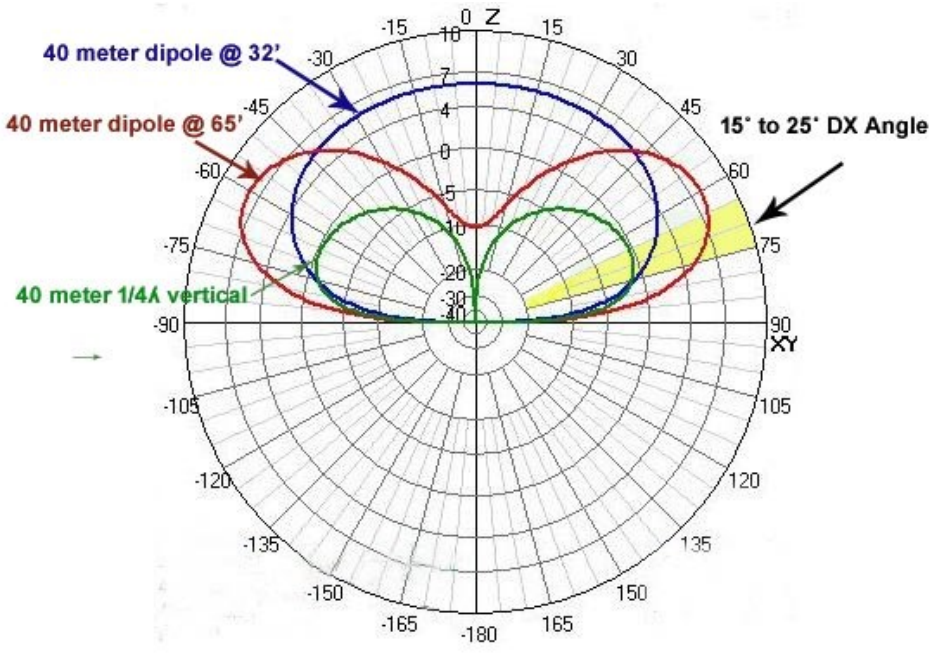


Figure 2a - A vertical vs a horizontal dipole radiaton patterns

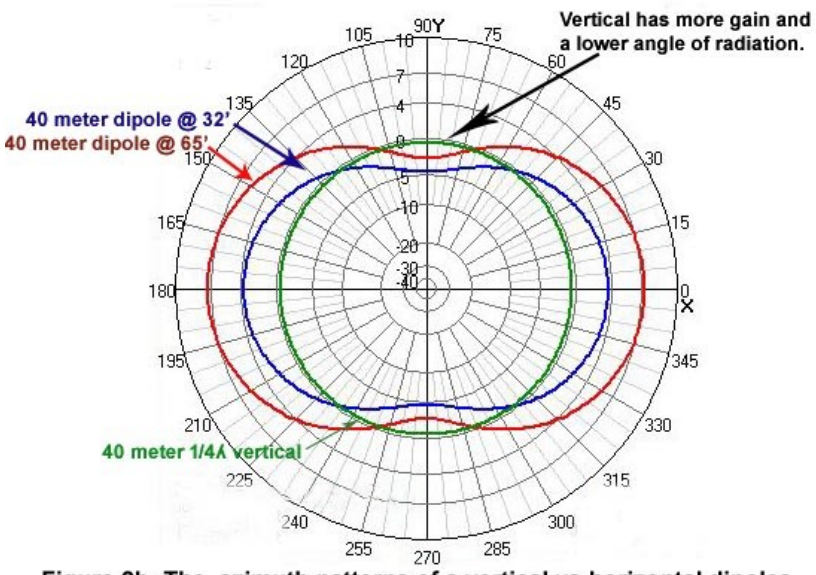


Figure 2b -The azimuth patterns of a vertical vs horizontal dipoles

The Half Square Vertical

The Half Square antenna is a bidirectional, vertically polarized, phased-array 2 element beam that has gain and a low angle of radiation. The Half Square antenna is a great wire antenna for DX, especially on 40 meters and below where very high horizontal antennas would otherwise be required. Also, radials are not required.

The Half Square has two vertical in phase 1/4λ radiators spaced 1/2λ apart and connected at their tops by a 1/2λ non radiating phasing wire (The RF currents there cancel each other). See Figure 3a. The antenna can be fed at either the top or at the bottom of one of 1/4λ verticals. The top feed point is 50 ohms meaning that a coax can be directly connected with the center conductor connected to the 1/2λ wire and the shield connected to the vertical wire. To get the coax to the top of the antenna, some hams have used metal tubes as vertical radiators to support the horizontal 1/2λ phasing wire. The coax is fed up the center of one tube to the top where the shield is connected to the tube and the center connector is connected to the horizontal wire. The bottom feed point is high Z meaning that a matching network such as that shown in Figure 3a is required. See Figure 6 in reference [2] for more details on a matching network and more details on Half Square antennas.

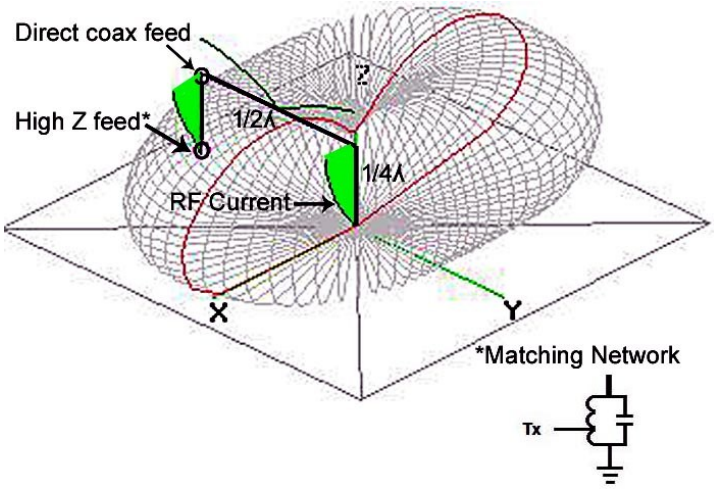


Figure 3a - The Half Square antenna

Note in Figure 3a that the Half Square's RF current is maximum at the tops of the 1/4λ verticals. This means that, unlike a 1/4λ vertical whose maximum RF current is at its base, the RF radiation from a Half Square antenna is high above the ground. This means that the RF radiation doesn't have to

pass through structures around the antenna resulting in less local loss.

The Half Square will produce a low angle bidirectional radiation pattern with approximately 3 dB gain over a single1/4ʎ vertical. See Figure 3b. Refer to [3] for complete information on the Half Square.

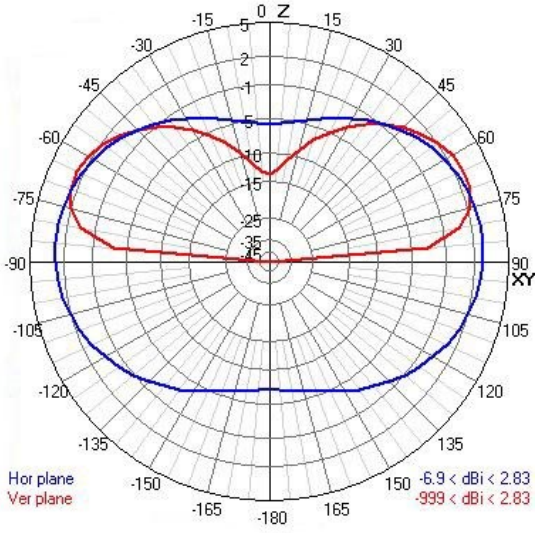


Figure 3b - Patterns of a Half Square antenna

Several other bands may be “squeezed” out of the antenna by using a 9:1 Unun and tuner to feed the bottom of one of the verticals. In this configuration the antenna acts as a random wire antenna on all but the “designed” band. Radials here would improve performance for the “un-designed” bands.

The Bobtail Antenna

The Bobtail antenna is a bidirectional, vertically polarized, phased-array antenna that has two horizontal non radiating 1/2ʎ wires that connect the tops of three 1/4ʎ verticals. See Figure 4a. As with the Half Square, the RF current is maximum at the tops of the verticals. This means that the RF radiation doesn’t have to pass through structures around the antenna resulting in less local loss. The Bobtail does not require radials.

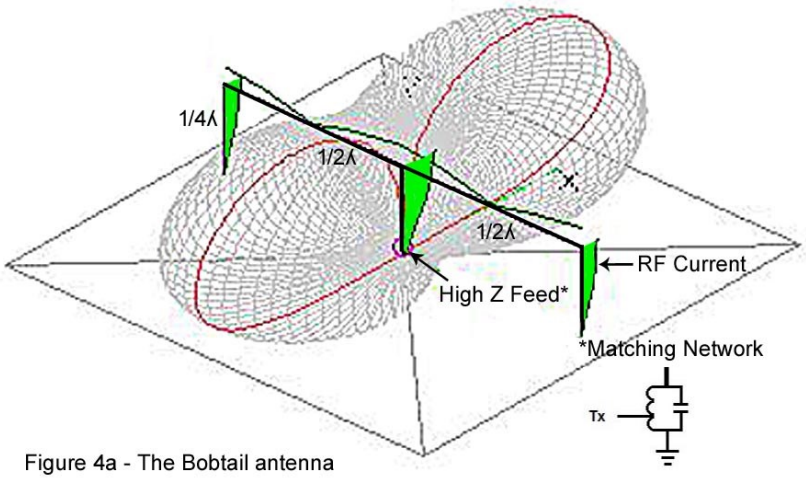


Figure 4a - The Bobtail antenna

The Bobtail is most effective for low angle signals and makes an excellent long-distance antenna. The Bobtail will produce a low angle bidirectional radiation pattern with approximately 5 to 6 dB gain over a single1/4ʎ vertical. See Figure 4b.

Like the bottom fed Half Square, the Bobtail requires a matching network for the transmitter. Reference [5] shows not only how to match a Bobtail antenna but also how to make it work on other bands. Reference [6] shows a homebrew matching network. Google “end fed antenna matching network” for commercial step down matching networks for both the Half Square and the Bobtail. An MFJ907 is a typical example.

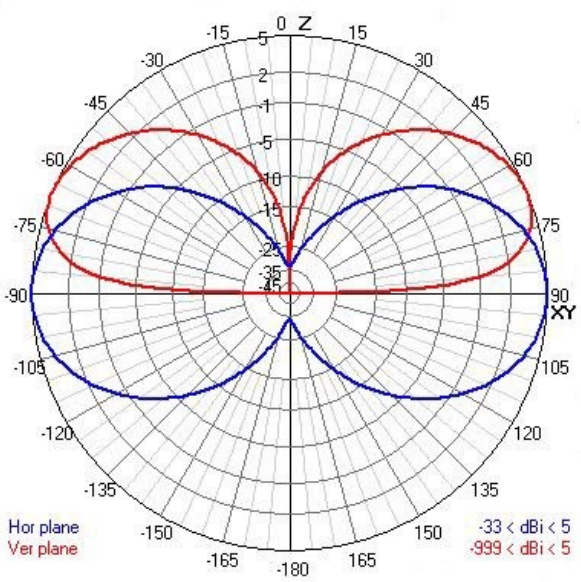


Figure 4b - Patterns of a Bobtail antenna

Additional Comments

Some hams have built Half Square and Bobtail beams by using two antennas in parellel. The Half Square beam has a gain of 7dBi and the Bobtail beam has a gain of 10 dBi. Reference [7] details a Half Square beam. I’ve never tried these beams due to lack of real estate space! However, one time I came across a ham who had a 2 element Bobtail 40 meter beam. He was quite impressed with its performance.

Some hams will build “upside down” Half Square or Bobtail beams, especially for vhf/uhf. I don’t know if there is any advantage to these “upside down” antennas. Refer to [8] for a vhf examples.

References

[1]. Radials Demystified:
https://w0tx.org/RoundtableArchive/2008-RoundTables/RT200804(APR).pdf, Page 3.
https://w0tx.org/RoundtableArchive/2008-RoundTables/RT200805(MAY).pdf, Page 3
https://w0tx.org/RoundtableArchive/2008-RoundTables/RT200806(JUN).pdf, Page 4
[2]. Voltage Feeding Half Squares and Bobtails:
http://www.antentop.org/w4rnl.001/scv1.html
[3]. Using the Half-Square Antenna for Low-Band DXing:

https://rudys.typepad.com/ant/files/antenna_halfsquare_array.pdf
[4]. Bobtails and Half Squares:
https://www.angelfire.com/md/k3ky/page38.html
[5]. 40 meter Bobtail as an All Band Antenna:
http://on5au.be/content/a10/scv/bc40ab.html
[6]. A 20 Meter Bobtail:
https://www.n5oe.net/index.php?id=20m-bobtail-curtain
[7]. A Half Square Beam:
https://ndl-dx.se/qth/The%20HSQB%20-%20A%20half-square%20beam.pdf
[8]. 2 Meter (2 Element) Bobtail Beam Project.
https://hamuniverse.com/2meterbobtailbeam.html
Half Square 2 Meter beam:
http://www.antentop.org/w4rnl.001/hs2.html
Bobtail 2 Meter Beam
http://www.antentop.org/w4rnl.001/hs3.html

ATTENTION

The DRC Board of Directors meetings are held on the 4th Wednesday of the month and are open to any member. Due to scheduling of meeting space, the board does not always meet at the same location and on occasion meetings are held via Skype. Anyone wishing to attend, please contact a board member prior to meeting night for specific information.

The Denver Radio Club
is an ARRL Special Service Club

Support your hobby and *join the ARRL today!*

http://www.arrl.org/

DRC's Trading Post

Don't forget you can find locally-sourced, ham-grown merchandise at:
w0tx.org/trade

Sunday August 27, 2023

DENVER RADIO CLUB HAMFEST

Adams County Fairgrounds

9755 Henderson Road in Brighton

Sunday August 27, 2023

9:00 am – 1:00 pm

$6.00 Admission
(Children under 13 free w/adult)

Exact Change appreciated

Doors open to the Public at 9am
Six-foot tables Advance Purchase..... $13.00 each
Tables at the Door..... $20.00
No guarantee of availability of "at the door" tables!

Vendor Setup begins at 7:30 on August 27th
Table assignment will be available at check-in
License Testing/VE Exams at 10 am
Talk-In: 145.490 or 448.625 PL 100.0Hz
GPS: Lat 39d 43' 19" N Lon 105d 10' 15" W
Handicapped Parking & Access Available

Visit our website for table reservations or email our Hamfest manager Bill Worthington at
drcfest@wØtx.org

Past Round Table Pages

Provided By Woody Linwood, W0UI

From the October 1960 edition.

October, 1960

The Round Table

The Denver Radio Club, Inc.

COTTERELL NAMED PRESIDENT OF DRC

Chic Cotterell, WØSIN, has been elected president of the Denver Radio Club in an exciting race that produced a tie, a runoff election, and a win by two votes.

Interest ran high in the election held at the September club meeting. The two incumbent board members on the list of nominees, Cotterell and Fontaine LaRue, WØRQI, were re-elected on the first ballot, along with two new officers, Russ Hendrickson, KØEPD, and Roy Raney, KØOVQ. (The other two out-going board members, Mike Lyons, WØPG, and Ralph Asbury, WØVDY, declined re-nomination.)

The names of the four newly elected board members were added to the list of four directors whose terms do not expire until next year, and a ballot was taken to name a president. As the ballots were being counted it became apparent that the race was between Cotterell and Raney. And as the last ballot was read, the two candidates were in a dead tie. A runoff election was held amid cheers of partisans, and Chic Cotterell was the victor by two votes. In response to a motion made from the floor, Roy Raney was named vice-president by acclamation.

In later balloting, Larry Moesta, WØJGW, easily won the post of secretary and Russ Hendrickson, KØEPD, was named treasurer.

The complete list of board members can be found in the masthead of **The Round Table.**

SMITH TO HEAD OCT. MEET

Carl Smith, WØBWJ, the Rocky Mountain division SCM will speak at the DRC meeting at Sabin Hall, October 20. As Carl is well versed on ARRL activities, this promises to be interesting to all, and especially to the traffic handler, the active ham should not miss this one.

Ø—Ø—Ø

A prominent VHF operator takes a serious look at the amateur fraternity and concludes it should be more fraternal in this month's "Letters to the Editor."

(See Page Seven)

Ø—Ø—Ø

PLANS ANNOUNCED FOR NEW DIRECTORY

A new edition of the **Colorado Ham Directory** has been scheduled for publication by the Denver Radio Club.

One of the first actions by the newly-elected board of directors was approval of a proposal to begin work immediately on a 1961 edition of the popular directory.

The first and only issue of the call book was published in 1959. No funds were available for a publication in 1960, in spite of many requests.

Club members connected with the project promise an outstanding directory of Colorado amateurs, with several unique features. The book will make its appearance early in 1961.

DRC's Emergency Responses

In the event of a disaster in the metro area, please monitor our repeaters on 145.490/448.625 (primary) and 449.350 (secondary).

The emergency Net Control Operator will provide information and/or requests to members for assistance.

W0TX Repeater Directory

Random Site Of The Month

Mongolian Radio Sport Federation

The Round Table Archive

Go to: w0tx.org/roundtable

The Round Table Article Index

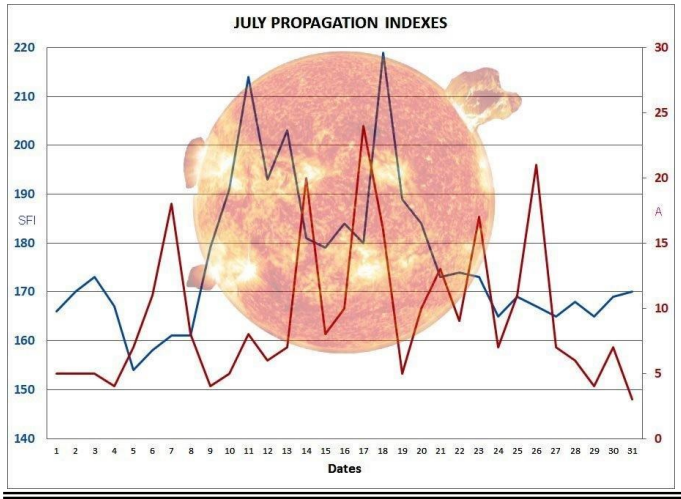
Go to: w0tx.org/RoundtableArchive/-RoundTables-Index.pdf

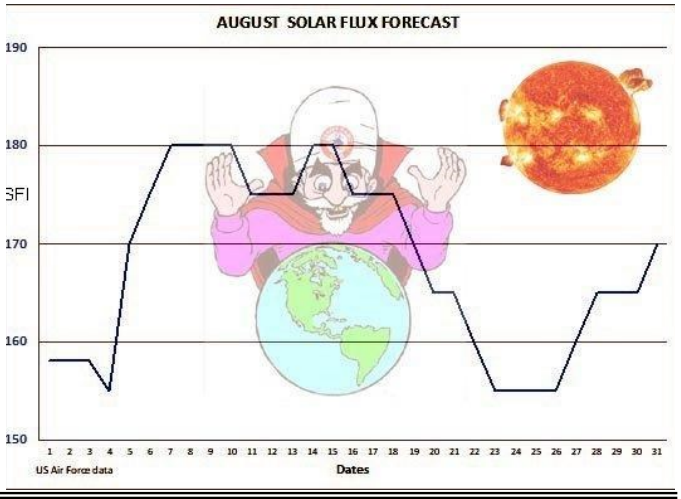
Past & Future Propagation Conditions

By Bill Rinker, W6OAV

The charts below show the Solar Flux and "A" indexes for last month and the forecast for this month's Solar Flux index.

Refer to the September 2010 *Round Table* for more complete information on interpreting these charts, which is available at: http://www.w0tx.org/RoundtableArchive/2010-RoundTables/RT201009(SEP).pdf





Upcoming Events

Hamfests & Conventions

Event	Date	Location	Sponsor Website
WCARC Hamfest	8/12/23	First Christian Church	arrl.org/hamfests
DRC Hamfest	8/27/23	Adams County Fairgrounds	w0tx.org/hamfest

Upcoming QSO Parties

The following are the Contests not sponsored by the ARRL. Please submit additions for future issues.

State/Province	Start Date	End Date	Sponsor Website	Notes
Maryland-DC	08/12/2023	08/13/2023	Anne Arundel Radio Club	
Hawaii	08/25/2023	08/27/2023	Hawaii QSO Party	
Kansas	08/26/2023	08/27/2023	Kansas QSO Party	
Ohio	08/26/2023	08/27/2023	Ohio QSO Party	
Colorado	09/02/2023	09/03/2023	Pikes Peak Radio Amateur Association	
Tennessee	09/03/2023	09/04/2023	Tennessee Contest Group	
Alabama	09/09/2023	09/10/2023	Alabama QSO Party	
Iowa	09/16/2023	09/17/2023	Story County ARC	
New Hampshire	09/16/2023	09/17/2023	Port City Amateur Radio Club	
New Jersey	09/16/2023	09/17/2023	Burlington County Radio Club	
Texas	09/16/2023	09/17/2023	Texas DX Society	
Washington	09/21/2023	09/22/2023	Western Washington DX Club	
Maine	09/23/2023	09/24/2023	Wireless Society of Southern Maine	
Nevada	10/06/2023	10/08/2023	Sierra Nevada Amateur Radio Society	
California	10/07/2023	10/08/2023	California QSO Party	

Source: qsoparty.eqth.net/index.html See contestcalendar.com/contestcal.html for a larger QSO parties list.

DRC Repeaters

BAND	Freq / Shift / PL Tone	Additional Information
6m	53.090MHz (-1MHz) 107.2Hz PL	
Packet	145.05MHz	**Metro Denver Area Coverage**
2m	145.490MHz (-) 100Hz PL	**Linked to 70cm / 448.625MHz. Primary frequency during emergency net.**
2m	147.330MHz (+) 100Hz PL	**Local area. Has voting receivers. Does not TX a PL.**
2m	147.330MHz (+) 131.8Hz PL	**Test mode operation. Send signal reports to Tech Committee.**
1.25m	224.380MHz (-) 100Hz PL	
70cm	447.825MHz (-) DCS~073; NB 12.5; +/- 2.5	**Saint Anthony's. Note: This is a narrow band repeater requiring DCS.**
70cm	448.625MHz (-) 100Hz PL	**Linked to 2m / 145.490MHz. 1° disaster net freq.**
70cm	449.350MHz (-) 100Hz PL	**Wide area coverage with Echolink, node # 4140. Secondary frequency during emergency net.**
70cm	449.775 MHz (-)	**Yaesu digital, C4FM, Wires-X, DN, VW & Data. No analog FM. W0TX Room 40931.**
70cm	446.7875MHz (-)	**BrandMeister Repeater: Slot 1 – Wide Area Traffic, Slot 2 – Local Talk Group 310804**

AUGUST 2023

DRC Net Sundays at 8:30 p.m. on 145.490 / 448.625 (no PL)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1  Full Moon	**2** **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	**3**	**4**	**5** **22 MHz & Up Distance -** Begins 1800 UTC
6 **22 MHz & Up Distance -** Ends 1759 UTC	**7**	**8**  Last Quarter	**9** **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	**10**	**11**	**12** **EME Contest (2.3 GHz & Up) -** Begins 0000 UTC
13 **EME Contest (2.3 GHz & Up) -** Ends 2359 UTC	**14**	**15**	**16** **DRC Online Meeting** Elmer 6 p.m. Meeting 7 p.m.  New Moon	**17**	**18**	**19** **10 GHz & Up -** Begins 6 AM Local
20 **10 GHz & Up -** Ends Midnight Local **Rookie Roundup - RTTY** 1800 - 2359 UTC	**21**	**22**	**23** **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	**24**  First Quarter	**25**	**26**
27	**28**	**29**	**30** **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	**31**		

See arrl.org/contest-calendar for additional details about contests.

DRC Board of Directors

President	W0GV	Gerry Villhauer	303-467-0223	president@w0tx.org
Vice-President	K0KPS	Kevin Schmidt	303-475-9234	k0kps@arrl.net
Secretary	WW0LF	Orlen Wolf	303-279-6264	secretary@w0tx.org
Treasurer	N0CRZ	Cathy Villhauer	303-467-0223	treasurer@w0tx.org
Board Member	N0XRX	Mark Thomas	720-438-0848	n0xrx@w0tx.org
Board Member	K1DBC	Doron Ben Chaim	720-254-1561	k1dbc@w0tx.org
Board Member	WG0N	Dave Baysinger	303-987-0246	wg0n@arrl.net
Board Member	KB0CHT	Jeff Irvin	Check Roster	Check Roster

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EmComm Coordinator	AD0UZ	Brennan Pate	*Check Roster*	emcomm@w0tx.org
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Please Let Us Know

Over the years we occasionally hear from hams who have read the Round Table in other states and countries around the world. We appreciate the comments and we would like to know where you are located. So if you live outside the Front Range or Denver Metro Area and read the newsletter either online, email or hard copy please send a short note via email with your *City, State* or *City, Country*.
We will publish it at a later date in our new regular feature called Round Table Round World.
To respond to this request send your information to roundtable@w0tx.org.

Subject: I'm located in…

Editor's Note

DRC members - this is your newsletter. Please email your club or amateur radio related suggestions to the editor. Members are the heart of The Denver Radio Club, so if you have an expertise or an interest in a particular segment of ham radio that you'd like to write about, you may email your submissions to roundtable@w0tx.org. The submission deadline is the 25th of the Month. ~ Editor